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COTTON MATHER'S RULES OF HEALTH.*

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Most men take pleasure in the manifestation of a certain playful irreverence toward the worthies of the past. With a perennial naïveté we are fond of patronizing our great grandfathers in a kindly sort of way. We smile at their quaintness and seriousness and ponderousness, while tacitly recognizing our own superior powers of perception and our more delicate sense of humor; and we rejoice in what always seems a deliciously original and somewhat temerarious fancy—that they may have possessed many of our commoner frailties behind that cloak of austerity with which respectful tradition, orthodoxical painters, and fickle fashion have helped to clothe them. And, as a rule, whatever our intentions, we are wont to weigh their lives and actions with scales built of our own contemporary criteria and with little real appreciation of the truth of the observation of the Gallic philosopher that "nothing seems so immoral (to-day) as to-morrow's code of morals,"[1] and the converse.

But after all, it is probably well that it should be so. How much of the spice of life we should miss, what a real misfortune it would be if one day, we should find ourselves able to enter wholly into the state of mind of those whose lives as it is, afford us so much cause for beneficent reflection and speculation. The aspiration of Mr. Dinkelspiel who recently gave utterance to the profound thought that "Der vorld vould be much nicer if ve could see udders as ve see ourselfs," would, if realized, result in a very flat world. Moreover, we should not be half as amusing to our descendants. The possession of truth in all things is doubtless precious, but we may, perhaps, be profanely thankful that with our human limitations there is little immediate prospect of being deprived of the greatest of life's privileges, the ever-present opportunity for its pursuit, while posterity is likely, for some time to come, to enjoy the pleasures of complacent contemplation of our inconsequent and entertaining wanderings. It is, perhaps, the part of the wise man in a study of the past, to rejoice in that which is fine, to smile at those contrasts which seem to him quaint and droll and unaccountable, but to hesitate to criticise or condemn.

The reverend Cotton Mather has suffered much from too serious historians who have judged him freely from a nineteenth century point of view. He was born in Boston in 1663. His father, Increase Mather, the leading citizen of New England, was for some years president of Harvard College, while his mother was the daughter of John Cotton, one of the prominent men of Boston. From early youth he was regarded as a remarkable character. He entered Harvard College at the age of eleven and a half, at which time he had already read Cicero, Terence, Ovid and Virgil and could write Latin with ease. He had also read through his

*Read before the Johns Hopkins Hospital Historical Club on March 13, 1905.

[1] "Rien ne semble plus immorale que la morale future." Anatole France, La vie littéraire, 8°, Paris, 1895, III, 74.

Greek testament and had begun Homer, Isocrates, and the Hebrew grammar. In college he mastered Hebrew and composed treatises on logic and physics. He graduated at the age of fifteen and was ushered into independent life with a rather fulsome eulogy uttered by President Oakes as he presented him with his degree; these remarks concluded with the following words: *"Cottonus atque Matherus tam re quam nomine coalescant et reviviscant."*

It is not generally known that in Colonial days the names of the members of the graduating classes at Harvard were recorded neither alphabetically nor according to scholarship but in the order of their social standing.[1] In the Quinquennial Catalogue of Harvard University—that sacred volume to which the late Professor Lane used to refer facetiously, as "the peerage," Cotton Mather's name stands second in the list of the class of 1678, preceded only by that of his cousin, John Cotton. It should, however, be mentioned that the class consisted of but four members.

Suffering from an impediment of speech which it was feared at first might prevent his entering the ministry, he is said to have spent a part of his first two years in the study of medicine, but conquering this infirmity, he began his career as a minister at the age of eighteen. These were days when a young man of ambition started out in life with a firm resolve to excel in many and diverse branches of science, and it may sometimes have happened, if he was endowed with a sufficient measure of self-assurance, that he thought he had mastered them all. Cotton Mather was a man of amazing general information. At the age of twenty-five he is said to have been able to write (*sic*) seven languages, including Iroquois; and of his superior learning and ability there was, apparently, a serene consciousness which the irreverent of to-day might style as knowing it all. His main goal in life appears to have been the presidency of Harvard College, and his failure to attain this was a bitter and nourished disappointment. Conscious of his remarkable attainments and exceptional erudition, Mather appears to have been rather impatient with the rest of the world for a lack of what he deemed due respect and appreciation for his qualities—and he made his fair share of enemies.

Born in an age of implicit and general belief in the powers of Heaven and, especially, of Hell in all its forms, Cotton Mather preserved throughout his life an unshaken faith in the immediate presence of a God who noticed and so forth rewarded every good action, and of a Devil whose malign hand was ever to be detected ready to seize and hold with tightening grasp whosoever was guilty of the slightest lapse from grace. He so trained himself that every common incident of life was, so to speak, a mnemonic for a special prayer or pious ejaculation, and for days together, he subjected himself to fasts and self-mortification such as might compel the admiration of the cloister. To the omnipresent Devil he was a mighty and militant enemy, and no one was so quick as he to detect and frustrate the malicious and insinuating schemes of his subtle adversary. When twenty-five years of age his attention was first directed to the evident manifestations of Satan in the bewitching of the child of a certain Mr. Goodwin of Charlestown by an agent of the infernal regions in the shape of a sharp-tongued old washerwoman who was duly executed for her hellish practices. And his preaching and publications concerning this case doubtless had their effect in spurring on the public to the decisive battle which was waged four years later at Salem against the powers of the invisible world. In this warfare Cotton Mather took an active part. But while tradition has, for nearly a century, pictured him as a relentless inciter of widespread executions, a study of the records appears to show that, active as he was in warfare against his infernal enemies, his voice was usually on the side of cautiousness and humanity, ever raised against the admission of "spectral evidence," and urging a recognition of the possibility that the Devil might manifest himself in the form of an innocent individual. And if, when, in later years, witnesses, jury, and even magistrates were tortured by doubt and self-distrust and remorse, the stern old warrior remained unmoved and defended to his dying day the good fight which he had waged and won against the legions of Hell, it was not so much, as his enemies would have it, an evidence of vanity and cruelty, as that his moderate and humane counsel left him little to regret.

Mather, although he failed to obtain the coveted presidency of Harvard College, was a great power in temporal as well as in spiritual affairs. He had, always, a lively interest in matters medical and was replete with advice and counsel, much of which was good. At the age of fifty-eight, he read, in the Philosophical Transactions of the Royal Society, a paper by Timonius on a "New Method of Introducing Small-pox by Transmission," in which was described the method of inoculation then in vogue in Turkey.[2]

Impressed by the probable benefits which the introduction of this practice might bring to a city in which small-pox was

[1] Quinquennial Catalogue of Harvard University, 1900, p. 83.

[2] The following passage from the Angel of Bethesda would seem to indicate that Mather had already learned of this practice from other sources. "There has been a *Wonderful practice* lately used in Several parts of the World, which indeed is not yet become common in our Nation.

I was first instructed in it by a *Guaramantee* servant of my own, Long before I knew, that any *Europeans* or *Asiaticks* had the least acquaintance with it; and some years before I was enriched with the communications of the Learned Foreigners, whose accounts I found agreeing with that I received of my servant, when he shewed me the scar of the wound made for the Operation; and said, That no person ever died of the *Small-pox* in their country that had the courage to use it.

I have since met with a considerable number of *Africans*, who all agree in *One Story*, That in their country *grandy-many* dy of the Small-pox: But now they Learn This way—: people take juice of *small-pox*, and *cutty-skin*, and putt in a Drop; then by'nd by a little *sicky sicky:* then very few little things like *small-pox;* and no body dy of it, and no body have Small-pox any more. Thus in *Africa*, where the poor creatures dy of the *Small-pox* like Rotten Sheep, a merciful God has taught them an *Infallible preservative.* Tis a *common practice*, and is attended with a *constant success.*"

spreading, Mather urged William Douglas, the leading physician of the town of Boston to put the method into practice. Douglas refused, as did all other physicians excepting a modest young man, Zabdiel Boylston of Brookline, who, on June 27, 1721, inoculated his son aged 13, a negro, and a little colored boy. This was only about six weeks after the introduction of the practice in London at the instigation of Lady Mary Wortley Montagu.

These proceedings caused great public excitement. Almost all the medical profession and many of the clergy violently assailed these two courageous men. Insult and vituperation were poured upon them by pulpit and press, while angry mobs threatened their very lives in the streets. On one occasion, while Mather was harboring, at his own dwelling, a convalescent from the operation, a mob attacked the house and threw a lighted bomb into the room occupied by the patient. Happily the fuse became detached and the bomb failed to explode. Attached to the bomb in such a manner that it might possibly have escaped destruction in the event of an explosion, was the following courteous message: "Cotton Mather I was once of your meeting, but the cursed lye you told of ——— You know who, made me leave you, you Dog. And Damn you, I will enoculate you with this, with a pox to you."

Threats of personal violence continued and Mather sincerely believed that his life was in grave danger. Though his fears may have been exaggerated, yet the following entry made in his journal a few days after the throwing of the "granado" is rather touching evidence of the state of mental exaltation under which he then laboured:[4]

"19/90" (Nov. 1721) "Now, I am so far from my Melancholy Fear on this occasion, that I am filled with unutterable Joy at the prospect of my approaching Martyrdom. I know not what is the Meaning of it; I find my mouth strangely stopp'd, my Heart strangely cold, if I go to ask for a Deliverance from it. But, when I think on my Suffering Death for saving the Lives of Dying people, it even ravishes me with a joy inexpressible & full of Glory. I cannot help Longing for the Hour, when it will be accomplished. I am even afraid almost of doing anything for my preservation. I have a Crown before me; and I now know by Feeling, what I formerly knew only by Reading, of the Divine Consolations with which ye minds of Martyrs have been sometimes irradiated. I had much rather Dy by such Hands, as now threaten my life, than by a Feaver, and much rather Dy for my conforming to the Blessed JESUS in Essays to save the Lives of Men from the Destroyer, than for some Truths, tho' precious ones, to which many Martyrs testified formerly in the Flames of *Smithfield*."

But the old parson and the young physician pursued the even tenor of their way, and gradually gained adherents. In a year Boylston with two other colleagues had inoculated two hundred and eighty-six persons with but six deaths, three of which may have been due to previous contraction of the disease from other sources, while among 5579 uninoculated who took the disease during the same period, 840, or more than one in seven, died. These results ere long, won the day, bringing lasting fame to both at home and honorable recognition in the mother country to the brave physician, Zabdiel Boylston.

Cotton Mather was a most prolific author, publishing during his life 382 works. His most famous publications are: "Magnalia Christi"—an ecclesiastical history of New England, which contains a mass of entertaining and valuable information about the early days of the colony, and his "Wonders of the Invisible World. Being an Account of the Tryals of Several Witches Lately Executed in New England," an amazing exposition of the strategy and machinations of the devil and of the tactics which the servants of the Lord should employ to resist them. Mather was a vigorous writer. He belonged rather to the class described by an author of his own time,[5] who, "with a Supercilious Gravity, have magisterially inveigh'd against the Vices of Mankind" than to the others who "by the nipping Strokes of a Side-wind Satyr, have endeavored to tickle Men out of their Follies." Perhaps there may be some who would class him among what the same author calls the "Sowr Pulpit-Orators."

His invectives against the Vices of Mankind were of no mean force, as the title of his well-known Execution Sermon may suggest. "TREMENDA—The dreadful sound with which the wicked are to be thunderstruck. In a sermon delivered unto a great assembly, in which was present, a miserable African (Joseph Hanno) just going to be executed, for a most inhumane and uncommon murder, at Boston May 25th, 1721."

One can fancy the terror of a superstitious negro on listening to this highly colored discourse, wherein he is apostrophized as "O forlorn Ethiopian," while his crime is referred to as of Ethiopian hue.

Mather's style was most remarkable, consisting, often, of a jungle of strange capitals and italics and Latin quotations interlaced with an exuberant undergrowth of punctuation marks, while in the recesses lurked the furtive anagram and, all too frequently, the Bandar-logian pun. But in the tangled underbrush there is a store of hidden treasure, and in many a passage of his writings there is fine dramatic force and vigor.

Cotton Mather was honored abroad as well as at home. He was made a Doctor of Divinity by the University of Glasgow in 1710 and became a Fellow of the Royal Society in 1713. He died on the 13th of February, 1728, and was accorded a public funeral no less impressive than that of his father in which he had taken a great pride.

[4] The privilege of consulting the manuscript diary of Cotton Mather for the year 1721, which is in the possession of the Massachusetts Historical Society, I owe to the courtesy of Dr. Samuel A. Green, librarian.

[5] The English Theophrastus. 8°. London, W. Turner et al., 1702, Preface.

Among his unpublished manuscripts he left a work entitled:

THE ANGEL OF BETHESDA.

'An ESSAY upon the *Common Maladies of Mankind.*
'Offering, first, The Sentiments of PIETY, where to the
'Invalids are to be awakened in & from their *Bodily* Maladies
'And then, A Rich Collection of *plain* but *potent* and
'Approved REMEDIES for the *Maladies.*
'Accompanied with many very practicable Directions, for
'The PRESERVATION OF HEALTH, to such as enjoy a good
'Measure of so great a Blessing.
'And many other curious, & grateful & useful Entertainments,
'occasionally intermixed.
'The whole being A *Family-physician,* which every Family
'of any capacity may find their Account on being supplied
'Withal.

The manuscript of this remarkable work I have recently had the privilege of inspecting, through the courtesy of the American Antiquarian Society.

In the first chapter the author quotes from a former treatise entitled, "MENS SANA IN CORPORE SANO": "Lett us look upon Sin as the *Cause of Sickness.* There are, it may be, *Two thousand Sicknesses:* And indeed, *any one of them able to crush us!* But what is the *cause* of all? Bear in mind, *that sin* was that which first brought *Sickness* upon a Sinful World, and which yett continues to *sicken* the world, with a world of Diseases: & *Sickness* is in short, *Flagellum Dei pro peccatis Mundi.*"

'Twill be impossible to enter into anything like a full description of this most interesting treatise. A few notes must suffice.

In chapter V, which is entitled "Nishmath Chajim"*—the breath of life—there are some striking passages. "It is well known that if *one Third* of our *Diseases,* be those which we call, *Chronical,* more than *one Half* of this Third, will be those, which in *Men* go under the Name of *Splenetic,* and in *Women* go under the Name of *Hysteric;* tho' the *Spleen* and the *Womb* are often enough unjustly accused in these Denominations. It is marvellous to see, in how many *Forms* we undergo *Splenetic* and *Hysteric* maladies; The very *Toothache* it self often belongs unto them: And Marvellous will be the *Success,* Marvellous the *Esteem,* of the Physician that can Discover 'em & Encounter 'em" . . . "These Maladies have many Symptoms, which may serve as *Diagnosticks* for them: Especially these TWO: That the *Urine* is Clear, Limpid, and Copious. And, That the Patient is *Chiefly affected* with his Indispositions, when he has just had his *Mind* under some Disturbance and Affliction."

He advises rest and encouragement, and recommends riding especially, but concludes: "UPON the Whole; OF all the Remedies under Heaven, for the Conquering of *Distempers,* & for the Preservation of *Health* & Prolongation of Life, There will now be found none, like serious PIETY." . . . . and "LET this be Remembered; Moderate *Abstinence,* & Convenient *Exercise;* and some Guard against Injurious *Changes of the Weather,* with an HOLY & EASY MIND, will go as far, in Carrying us with *Undecay'd Garments* thro' the Wilderness, to the Promis'd and Pleasant Land, which we are Bound unto, as all the *Prescriptions* with which all the Physicians under Heaven, have ever yet obliged us."

There is an excellent chapter on "The *Gymnastick* or an Exercitation upon EXERCISE," which contains much wisdom. Of riding, which he commends especially, he says: "*If a man knew, and would keep to himself,* any Remedy equal to that of a Course of *Riding, Opes ille exinde amplissimas facile accumulare posset,* he might soon come to keep *a coach* and know ye English of *Doct Galenus opes.*

"I hope the *Rider* in the meantime, won't be unmindful of Darby Dawn's caution,

But lett the Rider take a care;
Lest from a stumbling Horse or Mare
He don't take Earth instead of Air.

Chapter VII is in some respects, the most interesting of the work; it is entitled: "Conjecturalia or, Some Touches upon, A *New Theory* of many *Diseases.*" Quoting various authorities, he expresses the belief that a large number of diseases, among which are Small-pox, Plague, Consumption, Lues, bad colds and the itch, are due to infection with minute parasites which may be transmitted by the air or, under some circumstances by contact with the patient. He refers to these parasites which, he says, may be too small to be visible by the best microscope as "insects" or sometimes as "worms"; the chapter ends with the following paragraph: "But, O ye Sons of erudition, and ye *wise men of Enquiry;* Lett this *Enquiry* come into a due Consideration with you; How far a potent *worm-killer,* that may be safely administered, would go further than any Remedy, yett found out, for the cure of many Diseases."

In chapter XII he refers to the Gout as "*Dominus Morborum;* But especially, *Morbus Dominorum,*" and offers the following consoling advice to the gouty: "Now, lett ye *gouty* People that are *chastened with Pain on their Bed, and the multitude of their Bones with strong pain,* fall into serious and awful *Meditations,* on ye pain, which will be ye portion of them, on whom an All-powerful God will make known the *power of His Anger!*"

Chapter XIII is on "The *Gout's* Younger Brother or, The *Rheumatism,* and *Sciatica.*"

In chapter XX, on Small-pox, the interesting story of the introduction of inoculation is told.

In the section on diseases of the eye he waxes eloquent: "SPECTACLES! Mankind is prodigiously inexcusable, in

*This chapter has been published in book form. "Nishmath Chajim. The Probable SEAT of all Diseases, and a General CURE for them, further Discovered. More particularly, for *Splenetic & Hysteric* Maladies, which make so great a part of our Distempers." New London, 1722.

that the Name of ye First Inventor is entirely lost. That statues of *Corinthian Brass* have not Immortalized it."

Chapter XLII is entitled: "*The Main Wheel Scoured & oiled* or, Help for the *Stomach* depraved."

The peritonitis which, in most cases doubtless represented appendicitis, is described unwittingly, in a manner which would have delighted the author had he realized what he was doing, in an appendix to the chapter on Cholic, in the following words: "A grievous and fearful Disease, an Appendix to the *Cholic*, is now broke in upon a miserable world; called, The Dry-Belly-Ache." . . .

"Under the Torments of this horrible Disease, we may recommend unto the patient such sentiments of PIETY as we found the *Cholic* leading to." . . .

"In so Difficult a case, and where so wise a Conduct is required I dare not offer any prescription, but, *A Wise Physician*. Consult such an one and follow his Directions, relying wholly on ye Blessing of God."

The small volume which I have this evening, is entitled "Manuductio ad Ministerium or DIRECTIONS for a Candidate of the MINSTRY. Wherein, FIRST Right FOUNDATION is laid for his Future Improvement; And, THEN, RULES are Offered for such a Management of his *Academical* and *Preparatory* STUDIES; And thereupon, For such a CONDUCT after his APPEARANCE in the World; as may Render him a SKILFUL and USEFUL minister of the Gospel." This work was published in Boston, "Printed for *Thomas Hancock*, and sold at his shop in Ann-Street near the Draw-Bridge" in 1726. It is dedicated, in Latin, to the studious youth of the academies especially in Glasgow and in New England as well as to any young non-conformists in England compelled to work in private.

After a learned Latin introduction, he holds forth to his readers in twenty chapters upon various subjects, such as:

§1. DEATH Realized.

§2. The True End of Life Answered.

§3. Conversion to Piety accomplished &c.

The last chapters are RULES OF HEALTH and RULES OF PRUDENCE. There is so much that is wise and quaint and entertaining in these pages that I shall read the whole chapter, entitled: RULES OF HEALTH and a few extracts from his even more admirable RULES OF PRUDENCE:

"§19. I have yet more to do; I may not leave you, till I leave a few RULES OF HEALTH with you; which I shall do with the utmost Brevity.

"Having first encouraged you to cultivate an intimate Acquaintance with some Wise and Good *Physician*, who may have the continual *Inspection of your Health*, in your Friendly Conversation with him, I will defend you with the ensuing Admonitions.

"I. The most Acute Physicians, find themselves compelled, with our *Cheyne*, unto this General Direction. The *Grand Secret* and *Sole Method* for *Long Life*, and so for the *Health* which will befriend and sweeten it, is, To keep the *Blood* and *Juices* in a State of due *Fluidity*. And nothing will do this, but keeping much to a *Spare, Lean, Fluid* sort of a *Diet*. All who *live long*, and without much *Pain*, and after such a Life at length *Die easily*, are such as Live *Abstemiously*.

"II. *Borellus* has a Remark on many Students falling into a *Consumption*, That it often proceeds, *A Fumo candelarum hausto in Musaeis undiq; Clausis*.

"You will undergo the less of this Hazard, if you mind the Report of *Manlius; Ego multos Periculosos Morbos et Miserias hujus Corpusculi mei Vito, hac unica Ratione, quod semper utor Diligentia, cito eundi cubitum*.

"III. The *Medicina Gymnastica* has done Miraculous Things. *Bodily Exercise profits;* But no *Exercise* comparable to that of *moderate Riding;* whereof, the Reason why we find no more in the Prescriptions of the Ancients, (tho' *Galen* has a Chapter about it) for the Recovery of the Feeble, is because they were so simple as to *Ride without Stirrups*. The *Saddle* is the *Seat of Health*. As for the *Games*, which Exercise the *Spirit* and not the *Body*, particularly, the Noble and Ancient Game of *Chess;* These are by no Means proper for a *Student*.

"IV. 'Tis an Observation of that Great Man, the Lord *Verulam, Nihil magis conducit ad Sanitatem et Longaevitatem, quam Crebrae et Domesticae Purgationes*. A *Family-Purge* now and then taken, may be of Service to you. *Pillulae Ruffi*, especially when Chalybeated with adding about a third part of *Sal Martis:* Or else; A Bottle of *Anniseed Water*, with a *Dram* or two of *Rhubarb* steeped in it; These you may conveniently have always at hand for this Purpose.

"V. *Vander Heidan*, has not related an hundredth part of the Vertues, in *Cold Water*. I tender you the Advice which the Aged Servant of GOD gave to his Valued Son, *Drink not only Water; but use a little Wine for thy Stomach's sake*. And yet I would say, upon Drinking a Glass of Generous *Wine*, often take a Glass of *Water*. And if the *Beer* they bring you, be too *Strong*, dilute it with putting a sufficient Quantity of *Water* into it. But never take *Water*, or any thing else, *Cold*, when you are *Hot* with Labour. There is *Death in the Pot*.

"When you have run the hazard of disturbing your *Stomach*, with Ingurgitations from a Full Table, a Draught of *Cold Water*, will do *Good like a Medicine*.

"Going to Bed, and Sweating from a large Draught of *Cold Water*, not only stops and cures a *Cold*, but also often extinguishes a *Fever* at the Beginning.

"Daily to wash your Head and Mouth with *Cold Water*, is a Practice that cannot be too much commended; If it were only for saving you from the *Toothache*.

"For a Frequency in the Use of the *Liquors*, which they call *Spirits*, be as afraid of it, as you would be of a Familiarity with *Evil Spirits*.

"VI. When you go to Infectious Places, one of the best Things you can do, is to hold and chew a bit of *Myrrh* in your Mouth.

"VII. To feed much on *Salt-Meats*, won't be for your

Safety. Indeed, if less *Flesh* were eaten, and more of the *Vegetable* and *Farinaceous* Food were used, it were better. The *Milk-Diet* is for the most part some of the wholesomest in the World! And not the less wholesome, for the *Cocoa-Nutt* giving a little Tincture to it.

"VIII. *Shall I smoke Tobacco? Answer;* Be sure *Not,* if I can help it. Or let *Alsted* answer for me. *Maximus Tabaci Abusus est, quotidiano ejus usu, semetipsos, et bonas Horas perdere, et ex cerebro, mentis nobilissima sede, caminum et cloacam efficere.* In the Dutchy of *Berguen,* People may not *Smoke,* without purchasing a *License* for it. If you were to purchase of me a *License* for it, I know not how high Terms I should hold you to. If you want an *Hydragogue,* there is one preferrible in chewing some such Thing as a bit of *Mastich;* which would also whiten your *Teeth, and* sweeten your *Breath,* which *Tobacco* poisons. If once you get into the way of *Smoking,* there will be extreme hazard, of your becoming a *Slave* to the *Pipe;* and ever *Insatiably craving* for it. People may think what they will; But such a *Slavery,* is much below the Dignity of a *Rational Creature;* and much more of a *Gracious Christian.* I am sure, what the Great *Voetius* writes upon it, is very true; *Minime convenit viris honestis et gravibus; nominatim Ministris et Ministerii Candidatis.* There can be no *Apology* for your taking up the *slovenly Practice,* and the Pains that must be taken to conquer the *Poison,* if you are not well advised and assured, *That your Health requires it.* But I shall only recite what you will find in Two very considerable Writers, that you may form the better Judgment upon it. The One of these Writers is *Magnenus,* who tho' he be a mighty Friend to the Use of *Tobacco,* yet acknowledges, 'That it is not easy to relate, 'what are the *Damages,* which the Inordinate and Immoder-'ate Use of this *Fume* does bring with it; for besides the in-'satiable and greedy Lust of taking it, by its *daily Use,* the '*Memory* is impaired, the *Stomach* violated, the *Brain* exic-'cated, and the *Life* shortened; and the *Offspring* damnified. Yea, he lays this down as an undoubted Assertion; *That the frequent and familiar Use of it, can be good for no Man.* The Other is our *Gale,* who from his own Experience taxes the Smoke of *Tobacco* with very *Noxious Qualities:* He says, 'He found it *made* more Humours than it brought away; 'and tho' it *opened* his Body for the present, it proved in that 'very thing a Prejudice afterwards; and Nature was but the 'more Sluggish and Feeble anon, for the *Force* in this way 'put upon it. He says, At last *I came under a fixed Resolution to deliver my self from this Vassalage; And this I account not the least Deliverance of my Life.* And yet, after all, I am not so *Inflexibly sett,* as utterly to deny you the Use of *Tobacco,* if you are sure of any *Benefit* from it. Only I insist upon it, That you be, (If I may use a *Phrase,* that if it may seem to trespass upon *Good sense,* it shall yet have as much as the *Thing* I write against) *Excessively Moderate* in it. And if you are growing so Wise as to Retrench and Reform any *Intemperance* in it, which you may have been unawares drawn into, do it not *at Once,* but *by Degrees,* lest by too quick a stop to an *usual Discharge,* your Health may be endangered. But, upon the whole; If you have hitherto escaped this *Epidemical Contagion,* and are not yet a settled Inhabitant of the *Terra del Fuogo,* I cannot advise you in better Terms than those; *It is Good for you to abide even as you are;* And, *If you may be kept free, chuse it rather.* Yea, *My Son, If* Smokers *entice thee, consent thou not.* It is good Advice; and if you take it, you will one Day Thank him that gave it.

"But if I am against your taking *Tobacco* in *Smoke,* you may be sure, I shall not approve your taking it in *Snuff.* How *shameful* a thing it is, for *People of Reason* to confess, that they can't live easily half an Hour together, without a *Delight* so Sensual, so Trivial, so very Contemptible, as that of *Tickling their Olfactory Nerves* a Little? And even *bury* themselves alive, in *pungent Grains of titillating Dust?* A Learned Physician of the *French* Nation, will tell you, how many Diseases of the *Genus Nervosum,* do issue out of that *Pandora's Box,* from whence the Pinch of *Snuff* is taken. A *Quincy* will tell you, how wretchedly it *spoils the Appetite.* And a *Cheyne* will tell you, how much the *Eyes* as well as the *Stomach* fare the worse for it. You may dream, that the Passage thro' the *Os Cribriforme* will not permit the *Gross Powder* of your Snuff to enter into your *Brain;* yet some very thin and fine Parts of it will find their way thither. And what Mischiefs must needs follow a *Brain* so poisoned? Nay, One would think, that the great *Snuff-takers* had their Brain already touch'd; or they could not be so obstinately and incurably attach'd unto an *Evil Habit,* which their Folly has brought upon them. A very just Motto for the *Snuff-box* might be, A LEADER TO THE COFFIN. If it be offer'd you, *Away with it!* I say again, *Away with it!*

"IX. A Knight of my Acquaintance visiting the famous Dr. *Lower,* in his last Sickness, ask'd him for the best Advice he could give him, *How to preserve his Health, and prolong his Life;* the Doctor only answered him, *Don't eat too much!* After some other Discourse, the Knight not imagining that the Doctor had thoroughly answered his Enquiry, repeated it. The Doctor thereupon only repeated his Answer, *Why, Didn't I tell you; Don't eat too much!*—And, *further said not.* Sr. *Theodore Mayern* on his Death-bed gave this Advice to a Noble Friend, that ask'd his Counsil for the preservation of his health. *Be moderate in your Diet; Use much Exercise, and little Physic.* I would have added, *Guard against injurious Changes of the Weather; and especially be exposed unto the Night-Air as little as may be.*

"X. *Baglivi* is not the only Gentleman, who has observed, how much *Tranquillity* and *Serenity* of the *Mind,* contributes unto the *Health.* Hofman in his Treatise, *Des Moyens de vivre Longtemps,* has observed, That in the way of keeping the *Mind Quiet,* the *Fear of the Lord tends unto Life.* An *Holy* and an *Easy* Mind, is the most *Healthful* Thing under Heaven: The most potent *Prophylactic* in all the World. I need say no more.

"Only This. Forever *Obsta Principijs.*—If any Sickness

come upon you, be sure to be *Sick soon enough.* Maladies taken at the Beginning may be easily and presently conquered; when—*Delays are dangerous.* And if you are upon a Recovery from any Malady, *Ben't Well too soon!*

"20. I have now no more to do; but only single out a Few RULES OF PRUDENCE, the Observation whereof may be your Preservation from very many Wrong Steps, in the Way you have now before you. It cost the *Prussians,* the Trouble of a *War,* before they could oblige their Neighbours, to call them no longer *Brutos,* which they did before the Tenth Century, but, *Prussos,* which signifies, it seems, *A Prudent People.* I wish it may cost you no more Trouble, than only a little *Reading* of, and *Thinking* on, certain *Maxims of Prudence* to render you one of that People. I shall not say, how much it has *cost* me, and what a *Dear-bought Experience* it is, that has enabled me to recommend them. . . .

"I. The *Italian* Maxims are no *Imprudent* ones. One must not *Spend all he hath;* nor *Do all he can;* nor *Tell all he knows;* nor *Believe all he hears.*

"And there is a Sentence of a *Greek* Poet, worthy to be remembred with you; which in plain *English* will tell you, *No wise Man will be taken a second Time, in an Error he hath suffered for.*

"II. It is a Lesson worth more than an Ingott of Gold, which one who *saw many Things,* has left, for what is to be uttered in Company; *Bis prius ad Limam quam semel ad Linguam. Think* before you *Speak; Think* before *whom* you Speak; Think *why* as well as *what* you Speak. And Remember, *In multiloquio Stultiloquium;* And *Least said soonest mended.*

"It is a very prudent Remark; If one observes these Three small Imperatives, *Audi, Cerne, Tace,* he will need no other Passport for Travelling over the World. You will have a good Note of Wisdom, with two *Satellits* to it, in my reciting to you the Observations of a very Discrete Man, who said; *He had often got hurt by eating too much; rarely, by eating too little; Often got hurt by wearing too few Cloaths; rarely, by wearing too many; Often got hurt by Speaking; rarely, by holding his Tongue.* . . . .

"VII. Let it be as a *Law of the Medes and Persians* with you, *That you will never sacrifice any Hours of a short Life,* in *Contentions:* Especially in *Personal* Contentions, and Quarrels and Squabbles, and *Vitilitigations. Abundance* of Sin will be unavoidably committed in them; And, *The Game will not pay for the Candle.* . . . .

"IX. Don't Use your *Pen,* and Lose your *Time,* in *Eristic Writings,* any more than unquestionable *Duty* and *Prudence* makes to be absolutely Necessary. Writing upon a Point, and in the Way and Strain of *Controversy,* will not only have a Tendency to discompose the *Peace* of your Mind, but miserably Divert the *Studies* of a short Pilgrimage, from such things as would be much more Profitable for your self and others. Anon, the *Grand Point* of the *Controversy* will be, only *Who has most Wit or Grace of the Two,* you, or your Antagonist. A *mighty Business!* If *Jerom* were pleased in an Hectoring way to forewarn his Opponents, that he was, *Cornuta Bestia;* I hope *you* won't be so.

"X. If Calumnious *Quills* have publickly scratched you,—*An Respondendum semper Calumniis?*—No. Look as far back as Two Thousand Years ago, and you will find even a *Plato* giving a Pattern to a Christian, in his declining to take any Notice of the Invectives which a *Xenophon* had used upon him.—It may be, the *Scribblers,* are sorry *Scoundrels,* and such vile *Children of Sheth,* as it is beneath you to let them know that you have so much as read their Follies.—Or be they what they will, *for the most part,* the best way will be to, *Shine on,* Regardless of what the *Batts* and *Owls* may mutter against you. Or, if that Metaphor be too *Sublime,* let me say, At least *As the Moon among the lesser Fires,* keep a steddy Pace, *Walking in your Brightness,* notwithstanding the unregardable Allatrations of your Adversaries. If they persecute you with *Libels,* 'tis a notable Hint, that *Le Clerc* has given you. Instead of answering them, write such learned and useful *Books,* as will be of *perpetual Service* to Mankind. These will procure such a casting and lasting *Testimony* for you, that there will need no more to make a Man ill tho't of, than this; That he was a *Thersites* to *you,* and one that wrote against you. These *Books* will be durable Monuments of your Valuable and Honourable Character, when the Libels of these poor *Animalculicuncles* will perish among the *Wast-Paper,* which the *Haberdashers of small Wares* have occasion for.

"And if any *Preacher* should be so impertinent as to have any Girds at you in the Pulpit, remember the Advice of the sweet-spirited *Melancthon* to *Vitus Theodorus,* when the hot-spirited *Osiander* had preached against him; *I charge you, Don't Answer the Man; Hold your Peace; Go on in your Ministry as if you had heard nothing!*—The Gentleman soon found his Account in hearkening to his *Candid* Adviser.

"That what I am driving may stick, you shall have it in the Form of two old Rusty Nails; The One, *Magnum Contumeliae Remedium Negligentia;* The other, *Sile, et funestam dedisti Plagam.*

"As wicked a Fellow as ever polluted a Pen, yet has this Passage worth transcribing from him, while his Name is not worth mentioning. 'The Malice of *Ill Tongues* cast upon 'a *Good Man,* is only like a Mouthful of *Smoke,* blown upon 'a *Diamond,* which tho' it clouds its Beauty for the present, 'yet it is easily rubb'd off, and the Gem restored with little 'Trouble to its Genuine Lustre. But an *Honester Pagan* than he, has told you, *Perditi Hominis profligatique Maledictis, nullius Gloria dignitasq; Violatur.* Old *Cicero* tells you so. . . .

"XII. While you are yet in your *Younger Years,* be always furnished with a Stock of Weighty and Useful *Questions.* By wisely and humbly offering These, and with the Modesty of One desiring to be Instructed, you may commonly *lead* the Conversation, even with your Superiours, & almost necessitate a *Profitable Conversation.* You may be, as *R. Jeremy*

was called, *The Master of the Questions.* A *Discretion* in this point, is a distinguishing Thing. But whenever you are *Arguing,* ordinarily propose every Thing rather *Socratically* than *Dogmatically.* Be not *Positive;* much less *Clamorous;* least of all *Furious.* But keep up an Air of *Modesty,* and carry on your Discourse, in the form of proper *Questions;* and as one willing to be *instructed* by him whom you are disputing with. 'Tis an *Excellent Wisdom,* this; To *Argue Handsomely.* . . .

"XVII. If you have laid up an Inexhaustible Store of *Stories,* accommodated unto all the Purposes of the *Profitable* and the *Agreeable,* and have the Skill of *telling* them *Handsomely,* and with a *Deliberate, Expressive, Unstumbling Brevity,* and produce them on many occasions, you may not only *Ingratiate* yourself wherever you make your Appearance, but also obtain almost any *Request* that you shall make one of *them* a *witty Introduction* to. The *Precious Stones* that every one sets a Value on, are called *Pleasant Stones.* But let not your *Pleasancy,* degenerate into any unbecoming *Levity.* Forever so *Regulate* it, and so *Moderate* it, that it may *Gracefully Terminate* in the most *Serious Discourse,* and if it may be, in the Inculcation and Insinuation of some *serious Maxim,* which may be *Good for the Use of Edifying.* . . .

"XIX. It may not be amiss for you to have *Two Heaps.* An *Heap* of UNINTELLIGIBLES; and an *Heap* of INCURABLES. Ever now and then you will meet with something or other, that may pretty much distress your Thoughts; But the *shortest Way* with the Vexations will be, *To throw them into the Heap they belong to,* and be no more distress'd about them.

"You will meet with some *Unaccountable* and *Incomprehensible Things;* particularly, in the *Conduct* of many People. Throw them into your *Heap of Unintelligibles;* leave them there. Trouble your Mind no further; *Hope the Best,* or *Think no more* about them.

"You will meet with some *Unperswadeable* People; No Counsel, no Reason will do any Thing upon the *Obstinates:* Especially, as to the making of due *Submissions* upon Offences. Throw them into the *Heap of Incureables.* Leave them there. And so do you go on to *do as well as you can,* what you have to do. Let not the *Crooked Things that can't be made streight,* encumber you.

"XX. 'Tis a Trespass on the *Rules of Prudence,* never to know, *when to have done.* Wherefore, *I have done!*"

MOVABILITY OF THE HEART PNEUMOTHORAX.

By W. J. Calvert, M. D.,

University of Missouri, Columbia, Mo.

C. C. L., white, American, male, age 19, student, came to Parker Memorial Hospital, medical service, February 6, 1905, complaining of pain in left side.

Family history strongly tuberculous.

Past history.—He has had the ordinary diseases of childhood, otherwise has enjoyed good health; has been sick in bed three weeks since Christmas but lately has been better. This a. m., about 10 o'clock, he had a sudden giving-way, sharp pain in left side, and sudden shortness of breath, increased on slightest exertion.

Physical examination.—Inspection. Left side is much larger than right; intercostal spaces obliterated; movement diminished as compared with the right side. Upon the left side movement was almost entirely confined to the upper three ribs, where it was increased. Lower portion of left thorax was almost motionless. Apex beat not visible. Palpation revealed a diminished vocal fremitus in upper front and axilla, and absence of vocal fremitus in lower front and side. In back vocal fremitus was diminished. No apex beat felt on the left side. Percussion gave a tympanitic note over entire left side from left border of sternum to posterior axillary line. In back the note was more resonant. Dull about the seventh rib. The boundary of left pleural sac could easily be traced by the tympany, which in the lower portion of thorax was of a different pitch from that of the stomach. Lower border of left pleural cavity was in the mammary line at the lower border of eighth rib, anterior axillary line at upper border of ninth rib, mid-axillary line at upper border of tenth, and in scapular line at upper border of eleventh rib. No heart dulness to left of sternum. Diaphragm evidently pushed downward. Auscultation gave diminished respiratory sounds with few moist râles on inspiration. Once or twice an amphoric quality was noted in the respiratory sounds.

Right side. Movement increased, equally distributed over entire side. Heart beat noted in fourth and fifth interspaces at right border of sternum. Heart beat palpable. Vocal fremitus increased. Percussion note was slightly higher than normal, respiratory sounds loud, slightly roughened, and an occasional râle. Liver dulness normal. Splenic dulness was obliterated, organ not palpable.

Heart. Apex beat to left not visible or palpable; to right, heart beat was visible and palpable in fourth and fifth interspaces at right border of sternum. Dulness to left of sternum completely obliterated even on deep percussion. To right, heart dulness extends from third to sixth rib. At lower border of third rib heart dulness is three and one-half; at upper

border of fourth, four and three-tenths; at lower border of fifth, five and one-half centimeters to right of mid-sternal line. The angle between the right border of the heart dulness and liver dulness is acute in place of a right angle. On auscultation the heart sounds to the left of the sternum could be faintly heard and appeared as if far away, while on the right side they were distinct and sounded as if they were just under the skin. In character, they were rapid, varying from 108 to 148 per minute, weak, clear, and free from murmurs. The second pulmonic was slightly accentuated. When the patient leaned forward the heart fell forward against the left anterior thoracic wall with a bound which could easily be felt. The apex beat could then be easily felt and seen, and the sounds appeared just under the skin, as described for the right side of the sternum. Apex beat was midway between the para-sternal and mammary line. No murmurs were heard. When patient assumed a dorsal position the heart fell backwards away from the left thoracic wall when the heart sounds to the left of the sternum became distant as before.

Once during the course of the disease fluid was thought to be present in the thorax, but positive signs were not obtained. A movable dull tympany was noted in the lower portion of the cavity but no further signs were observed. Judging from the subsequent history, fluid was never present. On puncture air alone was withdrawn.

The patient remained in hospital twenty-three days, during which time very little change in signs was noted from day to day. Temperature never went above 101° F., and dropped to normal during the first week in hospital. The percussion note, etc., remained practically constant until towards the close of his stay, when all the signs began to disappear. The note became resonant at the apex and gradually extended downward, the heart dulness began to be noticed to left of sternum and gradually extended almost to mammary line, and the pulse became normal. When examined about two weeks after leaving hospital a large rough friction sound could be heard in the lower portion of the left side. It suggested a lung hanging loose in the pleural cavity and bounding from place to place against the thoracic wall. At this time no signs of fluid were present. Pulse was again rapid. Heart dulness was slightly to right of sternum. There was no fever; no dyspnœa, except on undue exertion, and at no time were tubercle bacilli found in sputum.

Examination, March 23. The lung completely fills the pleural cavity. There are no pleural rubs and but few moist râles on inspiration. The heart dulness extends to one-half centimeter inside the left nipple line, no dulness is elicited to right of sternum. The pneumothorax has entirely disappeared.

Diagnosis.—Pneumothorax without effusion—recovery.

The forward and backward movement of the heart observed in this case is commonly seen in hydro- and pneumo-pericardium; but in the literature at hand has not been recorded in pneumothorax of the left side. On careful examination of this case hydro- and pneumo-pericardium were excluded. In these the sac is distended with either water or air, which permit the heart to sink by gravity toward the lower side. Consequently an explanation of this heart movement is necessary. In pneumothorax of the left side, the factors essential to this movement of the heart are a change in size and position of the pericardium, change in position of the left lung, pleura filled with air, and the intra-pleural pressure.

The pericardium is firmly attached above and behind to the right of the vertebral column, to the large blood-vessels, as is shown in Figs. 1 and 2, and below to the diaphragm, as is shown in Fig. 1. The movement of the pericardium about its attachments is limited. Consequently any change in position of the pericardial walls must be associated with a change in position of the large blood-vessels, the diaphragm, by stretching of the wall itself, or by a combination of two or

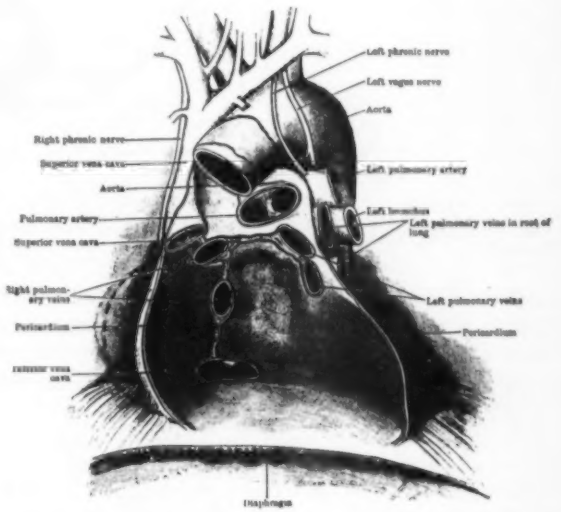

FIG. 1 is reproduced from Cunningham's Anatomy, Fig. 551. It shows the pericardial attachments to the diaphragm and large vessels, and the attachment of the heart to the large veins behind and to the right of the median line. The dotted line to the right is intended to show the displacement of the right wall of the pericardium by the pressure from the left pleural cavity.

more of these factors. From above and behind the heart swings free in the pericardial sac toward the left side, as shown in Fig. 2, swinging about its attachments, as a hinge, in whatever way gravity may carry it.

The heart is held in position by the pericardial sac, the large vessels attached to its base, and by the lung supporting the pericardial sac. If the lung is collapsed the pericardial sac will not retain the heart in its normal position.

In pneumothorax of the left side, in the absence of pleural adhesions and extensive consolidation, the lung collapses and falls toward the posterior portion of the pleural cavity, usually lying on the posterior thoracic wall next the vertebral column. In this case the lung was directly against the posterior thoracic wall, shown by the defective resonant note in the back.

Consequently the lung offered no support to the left wall of the pericardium. The movement of the heart toward the right in left pneumothorax is one of the earliest signs. The pressure on the left wall of the pericardium pushes this wall against the heart which transmits the pleural pressure to the right wall of the pericardium. This wall must support the pressure in the left pleural cavity. On account of this pressure the right pericardial wall is displaced toward the right to a point where the elasticity of the pericardial wall equals the pressure from the left pleural cavity, Fig. 1, dotted lines. The heart follows the right pericardial wall toward the right, and the left pericardial wall is kept in contact with the heart by the intra-pleural pressure. On account of the displacement of the heart to the right, the left wall of the pericardium is made more lax than normal. The pericardial sac is enlarged in proportion to the displacement of its right wall. But, on account of the intra-pleural pressure the pericardium is collapsed and in contact with the heart. In hydro- and pneumo-pericardium the pericardium is enlarged and distended by the intra-pericardial pressure. The pleural cavity passes both in front and behind the pericardium. The intra-pleural pressure is directed at right angles against the pericardium, Fig. 3, arrows. Consequently the pressure from behind will equalize the pressure from in front, leaving only

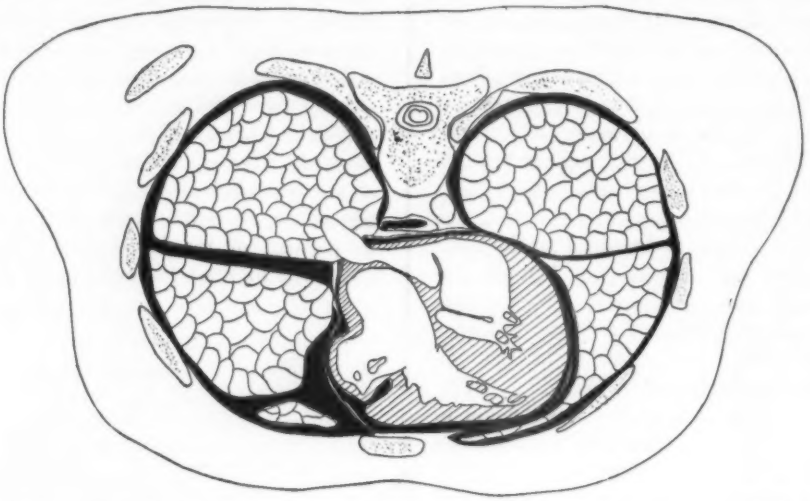

FIG. 2 represents a cross section of the body passing through the heart and lungs, and shows the attachment of the heart posteriorly and to the right of the median line. This picture was copied from an unpublished drawing made by Dr. C. M. Jackson, professor of anatomy, University of Missouri.

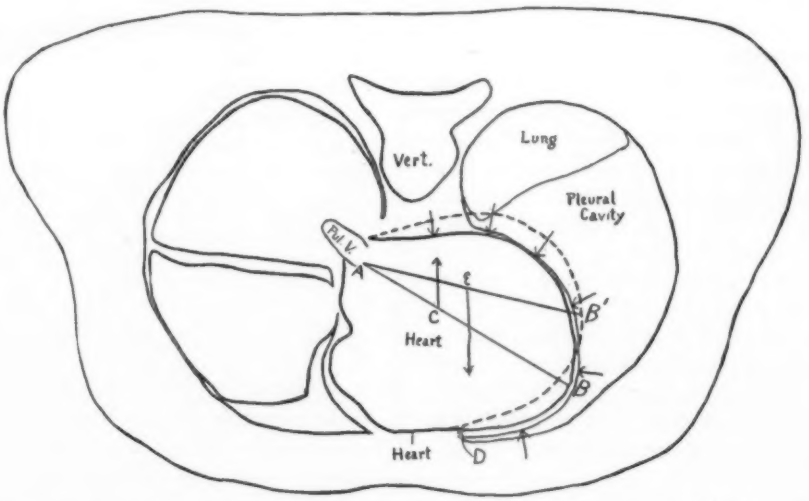

FIG. 3 represents a cross section of the body at the same level as Fig. 2. The collapsed lung is shown in the posterior portion of the pleural cavity. The dotted line represents the heart when patient is in the dorsal position. The heart is not shown to right of sternum.

the pressure directed from left to right to interfere with the backward and forward movement of the heart. When the body is in the dorsal position gravity acts on that portion of the heart to the left of its attachments to the large blood-vessels at an acute angle to the line *AB*, seen at *C*, Fig. 3. Unsupported by the lung, and in an enlarged pericardium, the heart falls backward away from the anterior thoracic wall to *B'*. The intra-pleural pressure keeps the pericardium in contact with the heart and separated from the thoracic wall, as shown at *D*, Fig. 3, dotted lines. When the body is in the ventral position, gravity acts on the heart at nearly a right angle to the line *AB'*, shown at *E*, Fig. 3. Consequently the heart falls forward to *B* and is against the anterior thoracic wall. The pericardium is now separated from the thoracic wall by the pleura. Consequently the heart beat may be seen and felt, dulness elicited, and sounds easily heard. When the heart is at *B'*, the apex beat may not be seen or felt. The dulness is absent. The tympanitic note is the same as in other areas of thorax, probably on account of tension of thoracic walls. The heart sounds are distant and indistinctly heard.

In hydrothorax with complete collapse of the left lung this movement of the heart should be present; however, with partial collapse sufficient support would be given to maintain the normal position. In either hydro- or pneumothorax with pleural adhesions, this movement of the heart cannot take place. Consequently, in the absence of hydro- or pneumopericardium, this backward and forward movement of the heart becomes an important differential sign between pneumothorax and a moderate degree of hydrothorax. As a pleural cavity greatly distended with fluid would rarely be mistaken for pneumothorax, this movement of the heart may be considered one of the positive differential signs in pneumothorax.

ENDOCARDITIS IN TUBERCULOSIS.[1]

By HARRY T. MARSHALL, M. D.,

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The cases in which endocarditis and tuberculosis occur together may be divided into three main classes: I, endocarditis preceding tuberculosis; II, endocarditis arising in tuberculous patients but not produced by the tubercle bacillus; and III, endocarditis resulting directly or indirectly from the action of tubercle bacilli. This is practically the classification proposed by Anders in 1902.

I.

ENDOCARDITIS PRECEDING TUBERCULOSIS.

For many years the view was held that tuberculosis does not attack the endocardium, and that tuberculosis and endocarditis are mutually antagonistic, and do not occur concomitantly. This latter view, advanced in 1855 by Rokitansky, obtained a large following. It was supposed that a valve lesion, by causing a congestion of the lungs, acts in some way to prevent the development of tuberculosis. Rokitansky stated the hypothesis that "Persons laboring under enlargement of the heart (dilatation, hypertrophy, and their complications), whether primary or superinduced by mechanical obstruction at its orifices, do not contract tuberculosis." He also held that any other condition producing cyanosis had the same influence, and that cyanosis was a complete protection against tuberculosis.

This hypothesis, which was supported by finding how rare tuberculosis is in mitral disease, as compared with its relative frequency in aortic disease, obtained the not unqualified approval of the clinicians.

Rokitansky's doctrine was successfully attacked by Frommhold in 1875, who, in studying 277 cases of heart disease, found 22 (8 per cent), with pulmonary tuberculosis, the left side of the heart being affected in all but one instance. Since this observation there have been many others in which the heart has been found affected in tuberculosis in varying percentages, thus: Birch-Hirschfeld found chronic pulmonary tuberculosis in 20.8 per cent of 4359 routine autopsies, while in 107 cases with lesions of the heart valve, tuberculosis occurred only 5 times (4.6 per cent). In 2 cases with pulmonary stenosis there was pulmonary tuberculosis. Krygen had 10 cases of endocarditis in 1100 autopsies on tuberculous patients, 4 showing aortic insufficiency, 3 mitral insufficiency, and 2 pulmonary stenosis. In Osler's series of 216 autopsies on patients dead of phthisis, 12 presented a fresh endocarditis. Of these the mitral valve was affected 8 times, the aortic valve 3 times, the aortic and mitral once. One case was an ulcerative endocarditis, the other eleven, verrucose. Kidd reports finding heart lesions in 27 cases out of 500 autopsies on phthisical patients, one of these was a fibrous myocarditis, one a chronic endocarditis, the others apparently were fresh endocarditis, in 10 cases being on valves showing chronic changes. In nearly all of the cases showing chronic lesions there was a history of rheumatism. In over one-half of his series he was uncertain whether the tuberculosis or endocarditis was the primary lesion, nor could he find any definite relationship between the two processes. Potain (Semaine Méd., 1892) found phthisis 9 times in 54 cases of mitral disease. Anders reports 6 cases, 4 with mitral insufficiency, 2 with mitral stenosis. He had no cases of aortic valve disease with phthisis, but he obtained one each of aortic stenosis, and aortic regurgitation out of 40 cases which he collected. This is not the usual experience, as Traube and others found the lung trouble oftener associated with aortic disease than with mitral disease.

[1] Read before The Lænnec, March 22, 1905.

Anders concludes from his review that "the association of phthisis with primary valvular heart disease is probably more common than the usual clinical findings have thus far indicated." It seems, however, fairly clear that tuberculosis develops less often in patients with left-sided heart disease than in others. Graham attributed this relative immunity to: 1st, increased amount of blood in the lungs; 2d, greater expansion of the apices; 3d, increase of the involuntary muscle fibers of the bronchi.

Abrams noted that while patients with endocarditis and tuberculosis did well as long as compensation was maintained, when compensation failed the tuberculosis became fulminating, and he denied the value of congestion, insisting that the protection came from the cardiac hypertrophy.

Anders reviews the literature upon the changes in the symptoms of phthisis resulting from left-sided heart disease. Of these an increased tendency to hemoptysis is the most striking, and this bleeding returns frequently, and at times is very profuse. Dyspnœa is increased and is of the cardiac type. The temperature is lower. While in general the valvular disease retards the tuberculous processes, this is not always true, and the case may advance with extreme rapidity, the hemorrhage may be dangerously severe, and the lung condition may aggravate the heart disease. Anders found these cases unsuitable for mountain sanatoria.

Although a lesion at the mitral valve is associated with a relative exemption from phthisis, quite an opposite condition is met with in patients suffering with a lesion at the pulmonic orifice. This was recognized by Lebert, who reported 25 cases in which tuberculosis followed a primary disease of the pulmonary valve. Rokitansky took this finding as support for his hypothesis, holding that in pulmonary stenosis the supply of blood to the lungs was decreased, hence there was a greater susceptibility to phthisis.

Lebert estimates that 33 per cent of cases of pulmonary stenosis die of consumption if they live to their 20th year. Stoelker reported 16 cases of congenital pulmonary stenosis, and concluded that 14 per cent of all such cases living to the age of 20 die of pulmonary tuberculosis. In 5 out of 6 cases reported by Shultz there was consumption. Anders reviews the literature relating to tuberculosis with pulmonary stenosis and gives references to 36 cases.

II.

Endocarditis Arising in the Course of the Tuberculosis but not Produced by the Bacillus Tuberculosis.

A. We may make mention here of that large group of cases showing at autopsy a healed or latent focus of tuberculosis. Probably the great majority of all endocarditis cases present some tuberculous lesion. In most cases dying of endocarditis, in whom there is no clinical sign nor symptom of tuberculosis, a careful search at autopsy will reveal an old tuberculous scar or a focus of latent tuberculosis. Such a focus is found in a large percentage of all autopsies, the number varying with the observer, with the age of the patients, and with the locality. In general the percentage ranges from 40 to 80 per cent, although Naegeli claims that careful search will reveal such a focus in 100 per cent of all those who have reached 18 years. It is to be expected, therefore, that this group will furnish the largest number of cases in which tuberculosis and endocarditis are found together. In this connection it may be noted that the period of life at which the largest proportion of tuberculous patients is found, overlaps the age for the maximum incidence of acute rheumatism and endocarditis. These cases are of no clinical importance.

I can find no literature referring to latent tuberculosis in endocarditis. In the routine autopsies at this hospital no special effort is made to find a latent focus of tuberculosis, and in looking over the autopsies on endocarditis patients I have found only 20 such cases. 12 times the focus was in the lung; 3 times in the pleura; 3 times in a lymph gland; once in the pericardium; once a general serous tuberculosis. The condition was not recognized clinically in any case.

Reference may be made incidentally to another relationship between endocarditis and tuberculosis. Not infrequently an obscure case is met with in which these conditions may be confused. I found one case among the medical histories in which a diagnosis of tuberculosis was made clinically, while at autopsy this did not exist but an endocarditis was discovered.

B. In a number of cases a tuberculous patient receives a valvular infection from a secondary bacterial invasion. This secondary infection may occur either at the area of tuberculous infection, or the bacteria may find another portal of entry.

As we have seen, acute endocarditis is found in about 5 per cent of phthisical patients, but it seems probable that only a small proportion of these endocarditides are caused by the B. tuberculosis, the greater number being caused by other bacteria. Although many cases of endocarditis in tuberculosis have been described, there are very few in which it is clear that the endocarditis is a tuberculous process. The difficulties in the way of establishing the nature of an endocarditis will be discussed presently. We may say, however, that endocarditis not obviously of a tuberculous nature must be looked upon as at least doubtful, and such cases can be considered conveniently in this group of non-tuberculous endocarditides.

Most of the cases in the literature are of this character. Two groups of cases are to be considered here, those in which the bacteriology of the vegetation is unknown, or non-tuberculous, and those in which the tubercle bacilli occur but are not proven to be the cause of the endocarditis.

a. The tricuspid endocarditis described by Lancereaux (1866), quoted by Banquet, is not definite enough to enable us to make a diagnosis of the nature of the process. The same may be said of Letulle's (1875) description of the small vegetations forming a thick fringe on the valves of children who died of acute general miliary tuberculosis with signs of valvular (aortic) insufficiency.

Percy Kidd (1887) could not demonstrate tubercle bacilli

in sections from his series of cases, nor could he find good reason to believe that the endocarditis was due to this bacillus.

In the case reported by Griode (1889), quoted by Banquet, the very large fleshy vegetations on the tricuspid valve and in the right auricle showed no tubercle bacilli on stained section nor in culture. Bernheim's case of tricuspid endocarditis extending up over the endocardium of the auricle (see Banquet) was similar. In the same group we may include Osler's series, which were considered by him to be non-tuberculous.

The following cases also are to be included in this group: Potain's cases; the four cases of Hanot (1893); three out of Etienne's series of five (Nos. 3, 4, and 5); at least six and possibly seven of Harbitz's series of nine; most if not all of Teissier's series of 42 cases (cited by Anders). In only 12 of these cases were tubercle bacilli found on the vegetations. In one of v. Leyden's cases the vegetation showed streptococci.

b. Tubercle bacilli in endocardial vegetations.

Kundradt, Heller, and Cornil, working independently, demonstrated tubercle bacilli in endocardial vegetations in 1886. While this finding furnishes some evidence that the bacillus is causing the endocarditis, the objection has been raised that the bacteria may have been deposited by accident from the circulation upon an already existing vegetation, or may be contaminations due to technique. In order to establish the causal relationship between the tubercle bacillus and a vegetation, the bacillus must be present not only on the surface but in the deeper part of the vegetation, and must produce some anatomical alterations that are characteristic. In the following cases the tubercle bacilli were found either in stained sections of the vegetation, in cultures, or by inoculation of guinea-pigs, but whether their occurrence was accidental or whether the vegetation was a true tuberculous process cannot be definitely determined.

In two of Etienne's cases (1898) the tubercle bacillus was found by inoculation of guinea-pigs. Rindfleisch's and Buskart's cases are apparently of this group (mentioned by Londe et Petit).

Harbitz found the tubercle bacillus in 2 of his 9 cases, but considered their presence accidental. Judging from his histological description, one of the cases may well have been a true tuberculous endocarditis.

III.

The cases of endocarditis resulting either directly or indirectly from the action of tubercle bacilli may be grouped under several headings as: 1. Miliary tuberculosis. 2. True tuberculous endocarditis. 3. Tuberculous cardiac thrombi. 4. Tuberculous endocarditis from extension of a myocardial tuberculosis. 5. Toxic endocarditis of tuberculous origin.

1. Miliary Tuberculosis.

Although Corvisart, in 1806, described tubercles on the mitral valve, and Townsend, in 1832, described a large solitary tubercle one inch in diameter in the wall of the left auricle which apparently caused death from asphyxiation, the opinion prevailed generally that tuberculosis does not attack the wall of the heart nor blood-vessels. In 1859 v. Recklinghausen reported miliary tubercles under the endocardium of the auricle and ventricle of a patient who had died of chronic tuberculosis with miliary tuberculosis. The tubercles were translucent or opaque, projected slightly above the level of the endocardium, and also into the myocardium, and were covered with a smooth layer of endocardium. He considered that they started from the layer of myocardium just next to the endocardium.

In 1874 Letulle described what were probably miliary tubercles in the wall of the left ventricle of a five months' old infant dead of general miliary tuberculosis.

In 1878 Sänger reported two cases—a 9 months' old infant and a boy 7 years old,—and reviewed the literature of tuberculosis of the heart.

The study of tuberculosis in the endocardium assumed a special interest after the classical work of Weigert, 1878-82, demonstrating the mode of origin of acute general miliary tuberculosis, in which he showed that this disease depends upon a primary vascular focus of tuberculosis for its origin and spread. In two of the cases of miliary tuberculosis which he reported, both of them with a tuberculous thrombus in the pulmonary vein, he found "in the conus arteriosus dexter a few gray nodules projecting above the endocardium." The nodules were from pin-point to pin-head size. He said: "Miliary tuberculosis of the heart belongs to the *almost* regular occurrences in acute general miliary tuberculosis. It is probably absent once in ten times. . . . . The seat of preference is the conus arteriosus dexter, as far as the large papillary muscle inclusive, where the tubercles occur most regularly as fine, gray, or whitish nodules on the endocardium, which is appreciably raised over them. Second in order of frequency comes the endocardium of the right ventricle in general, then that of the left, especially on the septum." All subsequent observers have verified these findings of Weigert.

Benda calls attention to the fact that these are not endocardial but are really myocardial tubercles, as v. Recklinghausen described them, and lie beneath the elastic coat of the endocardium. They cannot be considered examples of true endocardial tuberculosis, unless they have ulcerated into the cavity of the heart, or unless an elastic tissue stain shows that the tubercle is above the elastica of the endocardium. Benda has reported such a case, which at autopsy was identical with the usual subendocardial tubercles. The cases of G. Lyon, Tiry, and Auché and Chambrelent, described by Banquet as true endocarditis, were probably subendocardial tubercles.

2. True Tuberculous Endocarditis.

v. Leyden includes the cases of Kundradt and Heller in this class, although Heller's case probably belongs to the group just considered. Tripier reported a case in 1890 presenting a mitral endocarditis in miliary tuberculosis. The nodule on the under face of the valve looked like a tubercle, and in stained sections showed appearances similar to those

seen in a tubercle, with giant cells, embryonal cells, a break in the elastica, and direct connection with the heart cavity. The valve was thickened. The cellular infiltration of the valve increased progressively from the base of the valve to the vegetation. Benda considers this the first case in which the connection between the endocarditis and the tubercle bacillus is definitely established. Birch-Hirschfeld described a vegetative and ulcerative endocarditis (1891) with tubercles, giant cells, etc., on the valves. Londe et Petit (1894) found a few tubercle bacilli in the vegetation, with a rather suggestive histological picture, and produced tuberculosis in a guinea-pig by inoculation. Although they did not consider their case a tuberculous endocarditis, and ranked it as undetermined, it seems fair to consider this a true tuberculous endocarditis.

v. Leyden (1896) reported upon endocarditis in tuberculosis. In his four positive cases the tubercle bacilli were found not simply on the surface but all through the vegetation, often many within one cell. In one case the diagnosis was made clinically of endocarditis, probably tuberculous. He was of the opinion that the bacteria were carried to the endocardium inside of cells.

In two of Etienne's cases (reviewed by Banquet) the fresh vegetations were carefully washed in sterile water to remove any bacilli from their surfaces, and inoculated into guinea-pigs in which tuberculosis developed.

In 1899 Benda reported two cases, which he ranks in his review of the subject as being, with Tripier's case, the only authentic cases of tuberculous endocarditis. His description, however, is not convincing.

Michaelis and Sanford Blum injured the aortic valves of rabbits, injected tubercle bacilli and produced a typical verrucose endocarditis with numerous tubercle bacilli in the vegetations and no other bacteria.

3. Tuberculous Cardiac Thrombi.

These thrombi, first described by Rokitansky (according to v. Leyden), were carefully considered by Birch-Hirschfeld in 1891 (Versammlung Deutscher Naturforscher and Aerzte, September 24, 1891). In the right auricular appendage of his case was a thick, fibrous, fleshy, adherent body, at first taken for sarcoma but under the microscope found to be a tuberculous thrombus, showing masses of leucocytes, areas of organization, caseous foci, and foci of recent typical tuberculosis, the latter usually in the depth of the thrombus, but also occasionally near the surface. Hirschsprung's case (1882) is, according to Benda's view, the first case of this kind that was reported. Whether Townsend's case (1832) was a solitary tubercle of the myocardium or a tuberculous cardiac thrombus is not certain, though apparently it was myocardial. Leuken's case is also not very definite (1865). This condition has been described also by Weichselbaum, Klebs, Kotlar, Chiari (see Nothnagel), and by Pick and Cade.

4. Tuberculous Endocarditis from Extension of a Myocardial Tubercle into Endocardium.

Moser, in a case of phthisis and tuberculous epididymitis, found an organizing thrombus containing caseous areas, giant cells, and tubercle bacilli. The endocardium was replaced by a rather thick layer of fibrous tissue on which the thrombus rested. He thought the process started beneath the endocardium and extended into the endocardium and thrombus.

In 1902 Sternberg demonstrated a specimen of a tubercle 2 to 3 inches in diameter in the wall of the right auricle which had ulcerated into the auricle and produced a general miliary tuberculosis. Cases such as these of Moser and Sternberg are not numerous. In this connection an article by Cabannes may be noted. In this he analyses 53 cases of tuberculosis of the myocardium. In 8 of these the auricle alone was affected, in 12 it was affected chiefly, the right auricle more than the left. The disease usually occurs as a solitary tubercle, in most cases arising from a pericarditis. These myocardial tubercles, however, give rise to tuberculous thrombi and tuberculous ulcers in the endocardium only in rare instances. Benda, in his review, gives as the only authentic examples of this form of tuberculous endocarditis the cases of Leuken (1865), Schürhoff, and v. Genersich.

5. From this review it is evident that it is no easy matter to prove that any given endocardial vegetation is produced by the tubercle bacillus. The bacilli must be demonstrated not on the surface but in the depth of the vegetation, where their presence could not be due to accidental contamination, and in this search stained sections are of more value than cultures or inoculations, as the position in which the bacteria occur is more certainly determined by this method. It must be shown by staining sections that the bacilli have not simply lodged in the vegetation but are actually associated with the lesions typical of tuberculosis, and finally, as Benda emphasizes, the elastic tissue stain must be employed to prove that the process is above the elastica, that is, in the endocardium, and not below, that is, in the myocardium. As we have seen, such complete proof has been furnished in few cases, and some writers, particularly the French, hold that the endocarditis in tuberculosis is due not to the direct activity of the bacilli in the vegetation, but to a toxin elaborated by the bacilli elsewhere, and carried by the circulation to the valves, where a toxic endocarditis is produced. Teissier, Hanot, Potain, and others are advocates of this view, Teissier holding that 40 per cent of cases show sclerotic changes in the valves. While sclerosis of the valves may result from the toxic materials circulating in tuberculous patients, just as we find a similar process after typhoid, it seems hardly probable that the vegetations arise from the toxins in the circulation alone. The bacilli in a vegetation may be missed for several reasons. A few bacilli lodging in the endocardium may furnish a focus of injury upon which a relatively large thrombus develops, all except the starting point of the thrombus being a bland propagated thrombus. It would only be by studying serial sections that the tuberculous focus would be found in such a case. Furthermore, the bacteria may be of low vitality, and may die out in the vegetation. In other cases of endocarditis now being studied a number of cases are found in which

cultures from the vegetations were sterile, or the cultures died in the tubes very rapidly, while sections through the vegetation showed traces of degenerated cocci, which had evidently given rise to the disease. Death of the bacteria in this situation would be especially apt to occur if the body forms any protective substances harmful to the parasite, for the vegetations are constantly bathed by a large volume of fluid in which the protective substances are carried, and are in a position favorable for attack by phagocytes.

The following cases were found in a review of the medical and pathological records of the cases of endocarditis treated at the Johns Hopkins Hospital.

Endocarditis Preceding Tuberculosis.

Autopsy 88.—Th. W., white, female, admitted February 26, 1890. Illness began about 8 months before with a profuse hemorrhage, after which patient was well until three months ago. At that time cough, with expectoration began, and patient began to lose weight and became dyspnœic.

Clinically the patient had tuberculous cavities in the lungs, bacilli in the sputum, and a systolic murmur at the apex of the heart.

At autopsy, in addition to tuberculosis of the lungs with cavities, and ulcers in intestine, there was an acute and chronic endocarditis of aortic and mitral valves.

In this case the chronic process probably preceded the tuberculosis.

Autopsy 276.—W. B., age 23, white, admitted January 21, 1892. Illness began less than 9 weeks before death with tuberculosis; when seen at hospital, in addition to signs of phthisis, he had a systolic murmur at apex and an accentuated pulmonic second; at autopsy, a chronic mitral endocarditis with insufficiency and stenosis, caseous bronchopneumonia and acute general miliary tuberculosis.

Miliary Tubercles in Endocardium.

Autopsy 8.—In a case showing chronic tuberculous pericarditis, acute general miliary tuberculosis, and chronic thickening of the aortic and mitral valves, "numerous very small gray miliary tubercles were found beneath the endocardium of the right auricle near the entrance of the superior vena cava."

Autopsy 415.—With chronic productive pleuritis with many tuberculous abscesses and acute general miliary tuberculosis, there was found on one leaflet of the mitral valve midway between the margin and base of valve, a distinct yellowish-white miliary tubercle.

Autopsy 633.—In an infant 11 months old, with rickets and tuberculous cervical and thoracic glands, there arose a caseous pneumonia and miliary tuberculosis, with 2 or 3 tubercles beneath the endocardium.

Autopsy 654.—A child of 3 years, with tuberculous glands and general tuberculosis, showed one nodule, apparently a miliary tubercle, at the base of the mitral valve.

Autopsy 783.—D. I., 45 years, black. Chronic peritoneal tuberculosis and acute general miliary tuberculosis, several subendocardial miliary tubercles appearing in right auricle, together with subepicardial and myocardial tubercles.

Non-Tuberculous Endocarditis in Tuberculosis.

Autopsy 41.—S. D., 19 years, black, female. Clinical course of rapid tuberculosis; no hemorrhage and persistent high fever. At autopsy, in addition to cavities in the lungs, etc., were found fresh soft granulations on the mitral valve.

Autopsy 427.—C. M., 40 years, white, female. The clinical course was obscure, no definite signs at heart or lung, but a high, irregular, septic temperature. At autopsy pulmonary tuberculosis with cavities was found associated with acute general miliary tuberculosis and an ulcerative endocarditis of the mitral valve. No tubercle bacilli were found in the valve ulcer.

Autopsy 783.—J. J., 36 years, white, male. The case presented clinically the signs of adherent pericardium and cardiac insufficiency. At autopsy, tuberculous adhesive pericarditis, etc., and subacute endocarditis of aortic, mitral, and tricuspid valves.

Autopsy 1874.—Wm. Mac. P., 48 years, black. Was treated for diabetes mellitus, the heart and lungs showing no characteristic changes. At autopsy, a cavity with tuberculous bronchopneumonia was found and acute endocarditis of the aortic and mitral valves with vegetations on the wall of the left auricle.

Autopsy 1131.—G. W., 58 years, black, male. Clinically, this case was diagnosed as tuberculous peritonitis, which was found at autopsy, together with a tricuspid ulceration.

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A CASE OF ACQUIRED CYST OF THE CONJUNCTIVA CONTAINING AN EMBRYONIC TOOTHLIKE STRUCTURE.[1]

By Edward Stieren, M. D., *Pittsburg, Pa.*

The following case of embryonic osseous tissue forming in the conjunctiva is unique in that it developed after the tenth year of life.

The patient, Miss M., aged 16, was brought to me by her cousin, Dr. Paul J. McLain, on account of a tumor of the left eye ball. The history of the case, as recited by her mother, is as follows:

The growth was first noticed when the patient was ten years of age. (The parent is positive that no growth was present during infancy.) At that time the tumor was about the size of a pin-head. From ten years of age until two and one-half years ago it increased very little in size and gave no trouble whatever. The child then began to complain that the growth annoyed her; there was no pain, simply a disagreeable feeling. From this time the tumor began to increase in size rapidly. During the last six months it annoyed her considerably, causing almost constant headache.

Examination.—With the patient looking downward and inward by retracting the upper lid one could see a tumor of the bulbar conjunctiva. The growth has every appearance of a dermoid cyst of the conjunctiva, is about the size and shape of an ordinary navy bean, and can be made to move slightly in all directions by force applied with the lid margin.

Excision was advised, and under holocain and adrenalin local anæsthesia the tumor was grasped with a blunt-tooth forceps. The sensation of a foreign body was imparted to the touch through the forceps, suggesting calcareous degeneration of the cyst. The tumor had rather a firm attachment to the episcleral tissue, but was shaved off with a cataract knife without difficulty. A small quantity of straw-colored fluid escaped from the cyst, the cavity being almost entirely filled with what appeared to be a well formed, beautifully white, incisor tooth. It possessed a covering, no doubt periosteum, very loosely attached, which was, unfortunately, lost in making a dry preparation of the specimen. The "tooth" had a well defined crown and neck with a tapering extremity resembling a fang. It measured 15 mm. in length, 9 mm. in its widest diameter, with an average thickness of 2 mm. Half of the structure was prepared as a dry specimen and the other half given to Dr. Elizabeth Moore, pathologist at Passavant Hospital, for histological study.

Histological Examination.

The portion of the specimen used for histological examination was decalcified slowly in 1 per cent. hydrochloric acid solution. After decalcification, the usual technique of making celloidin sections was employed. Cross sections were made which were stained in hæmatoxylin and eosin and in indigo-carmine. The microscopical examination reveals a well developed bone formation. The section presents a curved and a straight margin. On the curved margin the lamellæ are parallel to the external surface of the specimen and, probably, correspond to the fundamental lamellæ of true bone. The parallel system occupies about one-third the transverse diameter of the section. Scattered between the lamellæ are the spaces known as lacunæ—the bone corpuscles. The spider-like processes by means of which the lacunæ communicate—the canaliculi—can be easily seen. The remainder of the section is occupied by distinct Haversian systems. About each Haversian canal are the concentric lamellæ, with the lacunæ communicating by their canaliculi with the canals. In many places the Haversian canals show an endothelial lining. Between the Haversian system are lamellæ which correspond, probably, to the interstitial lamellæ of normal bone. The parallel system blends with the Haversian system at the ends of the section. By the indigo-carmine stain a few of Sharpey's fibers between the lamellæ can be demonstrated.

[1] Read at the annual meeting of the American Ophthalmological Society. May 11, 1905.

Since the foregoing was written I have been informed by Dr. Edward Jackson that a similar condition was reported by Galtier, under the title "Subconjunctival Osteoma," in the *Annales d'Oculistique*, March, 1895, the article being abstracted in the *Ophthalmic Review* for May, 1895. Through the kindness of Dr. Myles Standish I was able to refer to the original article this morning. The author says, in part: "Occurrences of this nature are very rare. No mention is made of them in the best known works upon the pathology of the eye, and it is only in the extensive treatise by de Wecker and Landolt that we find a short chapter upon this subject. Three cases are therein noted: one by von Graefe, one by Saemisch, and one by de Wecker."

Galtier reports a case of a girl ten years of age occurring in his practice. When the right eye, turned downward and inward, a well defined projection the size and form of a slightly flattened pea was found at the equator of the eye, above the horizonal meridian and behind the equator. The growth was removed with toothed forceps and scissors. The author states: "What was my surprise, upon dissecting it, to find its contents hard, absolutely osseous, and formed of very compact tissue." Its length was one centimeter, its breadth, seven millimeters. The question that occurred to the author was whether this was really a new growth, or a portion of normal bone accidentally detached from one of the orbital walls. An histological examination showed that the bony tumor appeared to be composed of normal osseous tissue. The author's suggestion that the growth might be due to the presence of a fragment of detached bone rather than to an actual neoplasm, is supported by the history that the child had received a blow by falling and striking the right side of her face and forehead some six or seven months before. At the time, however, there was nothing which pointed to injury of the eye, and as his case resembles very closely the three recorded in de Wecker and Landolt's work, and the one reported by myself, and there is no history of traumatism in any of the four, I give his theory very little weight. It seems to have made a deep impression in Galtier's mind, however, as he concludes his article by saying: "I even question whether the subject of sub-conjunctival osteoma is a legitimate one, and whether the cases quoted would not better be included under the head of fractures of the orbital vault, with an encysted movable fragment of bone; this classification would slightly alter the prognosis, although it is true that these

tumors are, up to the present time, classed with benign tumors of the conjunctiva."

In the histological examination of the case reported by me, it will be remembered that in several instances the section showed embryonic bone tissue, thus proving conclusively that bone can develop in the conjunctiva. Hence, it appears to me that Galtier's hypothesis in regard to osteomata, being encysted fragments of bone detached from the surrounding bony parts, is based on very slender facts indeed.

SOME OBSERVATIONS ON THE OCCURRENCE OF MICROCOCCUS ZYMOGENES.

By E. G. BIRGE.

[*From the Pathological Laboratory of the Johns Hopkins Hospital, Baltimore.*]

In the Journal of Experimental Medicine for 1899, MacCallum and Hastings described a new micrococcus, named by them *Micrococcus zymogenes*, which they isolated from a case of vegetative endocarditis both from the circulating blood and at autopsy. The micrococcus thus isolated was pathogenic for most of the ordinary laboratory animals, the animals dying of a general septicemia or, in some cases, of an acute endocarditis.

Since then Harris and Longcope have reported five more instances of the occurrence of the organism; in one case from a cesspool in Baltimore, and in the remaining four cases it was found as a secondary invader at autopsies in the Johns Hopkins Hospital. In two of these cases the organism was entirely non-pathogenic; in the other three it was only slightly pathogenic for the ordinary laboratory animals.

While working upon the bodies of certain crows sent to me from Washington I isolated an organism resembling that described by MacCallum and Hastings, but differing in some

respects from their organism. There were no lesions which could be attributed to the organism. It was isolated from the mucous exudate in the larynx in all cases.

Description of the Microorganism.

Morphology.—Stained preparations show the organism to be a micrococcus either spherical or very slightly oval in shape. It occurs singly, in clumps, and in a few preparations from bouillon cultures in chains of six to eight individuals, although in hanging-drop preparations a few chains of sixteen organisms were noted. The most frequent form of occurrence, however, is in pairs.

Hanging-drop preparations show the organism to be non-motile.

It stains well with the ordinary aniline dyes and remains deeply stained by Gram's method. Attempts to demonstrate capsules or spores by the various methods of staining were negative.

In size the organism is very much smaller than the *Micrococcus lanceolatus.*

Cultural Characteristics.

Agar.—Cultures made on agar slants gave at four hours a barely perceptible growth of discrete pin-point, grayish-white colonies. At twenty-four hours the growth was profuse, flat, slightly elevated, and restricted to the path of the needle. The growth by reflected light is of a grayish-white color; by transmitted light is translucent and of a smoky-brown color, seen best in old cultures.

The edges of the growth are usually somewhat serrated and elevated by the growth of larger colonies, sometimes discrete.

Colonies.—The discrete colonies on agar are very small, seldom exceeding one millimeter in diameter. Their characteristics are the same as noted above.

Ascitic agar.—The growth was the same as on nutrient agar, but was much more profuse.

Litmus glucose agar.—Stab cultures in litmus glucose agar gave a production of acid but not of gas. The acidity was distinctly noticeable along the line of the stab after four hours.

Bouillon.—Cultures in bouillon showed, after four hours, a slightly diffuse cloudiness, more profuse at twenty-four hours with no sediment. In the course of several days the organisms settled to the bottom of the tube, leaving the overlying fluid clear. No indol was produced either in bouillon or Dunham's solution.

Potato.—The first few cultures on potato showed no growth. After several generations there was a moderate growth; small colonies appear first after about 36 hours, later they become confluent. The growth is slightly elevated and somewhat moist at first. Later it becomes dry and brownish.

Gelatine.—A somewhat grayish, granular and opaque growth appears along the path of the needle in stab cultures in gelatine. In forty-eight hours a slight cupping of liquefaction appears at the surface, extends slowly downward, and eventually involves the whole medium. The liquefaction is much slower than in the case of the *Staphylococci.*

On gelatine plates small, pin-point, granular colonies appear, yellowish by transmitted light, which float in a cup of liquefied gelatine.

Blood serum.—The growth on blood serum resembles that on plain nutrient agar, but is more profuse. The surface of the medium at twenty-four hours is very moist, and in the course of several days the blood serum is partially liquefied. The fluid is clear and the solid medium is broken down.

Milk.—The most characteristic cultural reactions appear in its growth on milk. In litmus milk at four hours the litmus is completely decolorized, except for a narrow purplish band at the top, without coagulation of the milk. On shaking the culture the color returns throughout the medium but is lighter and a trifle more reddish than the original culture. This decolorization of the litmus is evidently due to deoxidation.

At twenty-four hours the medium is decolorized with a narrow purplish-red ring around the top as at four hours. On shaking, the color returns throughout the medium but is distinctly redder than before. There was a slight coagulation of the medium at twenty-four hours, which became very firm at thirty hours. The upper layers became softened and changed into a clear fluid definitely red at the surface, straw-colored below. This softening and liquefaction of the coagulum continued until there is a clear fluid throughout with a flocculent deposit at the bottom, the remains of the coagulum. The red color extends deeper into the fluid, and finally extends throughout the deposit, leaving ultimately a clear straw-colored supernatant fluid lying over the deep red deposit.

These reactions in litmus milk are absolutely constant, and when the organism isolated by MacCallum and Hastings was used as a control the changes followed one another in both cultures practically identically in time.

Pathogenesis.—Rabbits and pigeons were inoculated in various ways with suspensions of the organism. In all cases the result was negative.

One rabbit was inoculated intravenously with 2.5 cc. of a thick bouillon suspension from an agar culture, and ten days later it received 3 cc. of a similar suspension. After the first inoculation the rabbit was evidently sick for a day or so, but no reaction followed the second inoculation. Four days after receiving the second inoculation the animal was killed and the organism was recovered from the liver in pure culture. Cultures were also made from the heart's blood and spleen but remained sterile. There were no lesions in any of the organs. A second rabbit was inoculated intravenously with 2.5 cc. of a bouillon suspension of a similar twenty-four hour culture, but showed no reaction. A pigeon inoculated subcutaneously into the breast with a bouillon suspension of a twenty-four hour culture of the organism, recovered from the liver, showed no reaction whatever, either locally at the site of inoculation or generally.

Another pigeon inoculated subcutaneously with 2 cc. of a

bouillon suspension of the original organism gave a negative result.

These results are at a variance with those of MacCallum and Hastings, their organism being very pathogenic for all ordinary laboratory animals except guinea-pigs, white rats, and pigeons, which showed little susceptibility to inoculation.

In order to prove this organism to be identical with that of MacCallum and Hastings, a rabbit was immunized against it by intravenous injections of the organism in increasing amounts. Serum dilutions of 1:50 were made with suspensions of both organisms. There was a complete agglutination in both cases within two hours. The agglutination test was made macroscopically.

Ferments.—A culture in milk in which the process of liquefaction was going on was filtered through a Berkefeld filter, and about .5 per cent of carbolic acid was added to the filtrate to prevent the possible growth of any organism. A small quantity of this filtrate was added to sterile tubes of litmus milk. After thirty-six hours there was a soft coagulum which later contracted, leaving in the upper part of the tube a clear supernatant liquid. The process was similar to that set up by the live organisms, but was very much slower, and there was practically no change in the reaction of the milk.

Cultures and stained preparation, made from the filtrate and the milk, showed no organisms.

SUMMARY.

From the mucous exudate in the larynx of certain crows a micrococcus was isolated, corresponding morphologically and culturally with that isolated by MacCallum and Hastings from a case of vegetative endocarditis.

The organism, however, was not pathogenic for any of the ordinary laboratory animals, large doses having at the most a very slight effect.

A rennin-like ferment is secreted by the organism, which does not appear to be affected by small amounts of carbolic acid.

The organism can be distinguished from *Streptococcus pyogenes* on one hand, and on the other from the *Staphylococci*, by its characteristic cultural reaction in milk and by its doubtful pathogenicity.

I wish to acknowledge my thanks to Mr. W. J. Bennet, of Washington, D. C., for the material with which the work was done.

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NOTES ON NEW BOOKS.

The Surgical Diseases of the Genito-Urinary Tract. Venereal and Sexual Diseases. A Text-Book for Students and Practitioners. By G. FRANK LYDSTON, M. D. (*Philadelphia: F. A. Davis & Company, 1904.*)

Dr. Lydston's book has already taken a place among the more useful works on this subject, and those who have profited by the first edition will welcome the second with its additions and improvements. The work is a fairly satisfactory one for students; it contains the chief facts of this branch of medicine and surgery, and they are as a rule set down without undue expansion. One might be justified, in these days, in criticising unfavorably the rather crude illustrations found throughout the book. The drawings, for instance, which represent the introduction of a catheter teach no more than the fine photographs of the same procedure in White & Martin's text-book, and as works of art they are little short of barbarous. The author has elected to close his volume with a complete list of his own publications on genito-urinary subjects; one wonders if the author's photograph as a frontispiece would not have made a most fitting companion piece.

A System of Practical Surgery. By PROF. E. VON BERGMANN, M. D., PROF. P. VON BRUNS, M. D., and PROF. J. VON MIKULICZ, M. D. Volume V. Surgery of the Pelvis and Genito-Urinary Organs. Translated by WILLIAM T. BULL, M. D., Columbia University, New York. (*New York and Philadelphia: Lea Bros. & Co., 1904.*)

This volume impresses one as a most uneven performance. The chapter by Schede on the surgery of the kidney and ureter leaves little to be desired; but the bladder and prostate have hardly had justice done them by the father of cystoscopy. An important feature in the actual handling of cases, often overlooked in conventional text-books, is here thoroughly treated, and the student who wants to know what happens (or should happen) to patients when they leave the amphitheater where he has seen them operated upon, will get some satisfaction in this discussion of after-treatment. Palliative treatment, too, receives the consideration which it ought to get in a text-book of surgery, but which it usually has to forego.

Certain opinions rather dogmatically expressed run counter to American, or at least to Baltimorean, ideas, and from this point of view invite attention. The best method of treatment of prostatic hypertrophy is said to be the regular use of the catheter—an opinion expressed and sustained with what appears to be a fine disregard of all the recent work on the subject, and with no proviso as to the class of cases in which such a method of treatment is manifestly unwise. The prognosis of urinary fistulæ is said to be good, no mention being made of the large class of cases in which it is notoriously bad. The determination of the quantity of urea in the urine is said to be a procedure quickly and easily carried out, a dogma hardly sustained by recent work. Opium is said not to be necessary after anal operations, and yet it is advised that, after the Whitehead operation, the bowels be kept confined for eight or ten days. One wonders if, after such a long period of quiet, it would be worth while starting them again at all in elderly patients.

The chapter on cystoscopy is most elementary, only the very grossest description of the things seen being given. Other incomplete treatments and omissions include an absence of any mention of the abdominal incision for varicocele operations, the suave neglect of the large subject of perineal prostatectomy, the cursory discussion of the suprapubic route, and the failure to mention, or at last to emphasize, pollakiuria—the most important and often the earliest symptom of prostatic hypertrophy.

As to the fortune which has fallen to the German edition in

preparing it for American readers, an occasional ill-chosen adjective, a gauche expression here and there, and frequently recurring typographical errors (see p. 558, where "catheterize" and "cauterize" are hopelessly mixed) leave the impression that the work has not been done with nice attention to detail.

Travaux de Chirurgie. Anatomo-Clinique. Par HENRI HARTMANN. (*Paris: Georges Steinheil, 1904.*)

This volume, for which the versatile Hartmann makes himself responsible, contains the reports of work done at L'Hopital Lariboisiére and elsewhere on the surgery of the urinary tract and testicles. It includes an exhaustive article on the solid tumors of the kidney and a more or less trivial one on the bacteriology of acute vaginalitis; it corresponds more closely to an American Hospital Report than to a text-book, and should not, therefore, be criticized for lack of structure—an attribute which we could justly demand of a "book." On the average, the high standard of Parisian urology is maintained and the articles are for the most part thorough and painstaking. It cannot be said that the collection represents any noteworthy addition to surgical knowledge.

Errors of Refraction and Their Treatment: A Clinical Pocket-Book for Practitioners and Students. By CHARLES BLAIR, M. D., Fellow of the Royal College of Surgeons of England. (*Bristol: John Wright & Co.; London: Simpkin, Marshall, Hamilton, Kent & Co., Ltd., 1905.*)

This is a small book of 100 pages on the first principles of refraction. As all text-books on the eye, large and small, contain as much, if not more, matter on refraction, we hardly see what sphere this book aims to fill. The book is too elementary and too much abbreviated to be of service to anyone who wishes to seriously take up the study of the refraction errors of the eye and their correction with glasses. B. B. B., JR.

International Clinics. A quarterly of Illustrated Clinical Lectures and especially prepared Original Articles on Treatment, Medicine and Surgery, etc. Vol. IV, Fourteenth Series; Vol. I, Fifteenth Series. Edited by A. O. KELLY, A. M., M. D. (*Philadelphia: J. B. Lippincott Co., 1905.*)

A systematic review of even the ablest articles in these two volumes is out of the question. In them is to be found the usual subjects of interest in each special branch of the profession. Some are excellent, many full of important data.

Weber and Watson report a case of chronic polycythæmia with enlarged spleen (Vaquez disease), and bring forward evidence to show that the increased production of erythrocytes occurred in the bone-marrow, which has been stimulated by circulatory disturbances in some cases, and in others by a "primary excessive vital reaction."

Duckworth in another paper points out that, contrary to his former opinion, gouty ailments, at least in the larger cities of America, occur not infrequently, though usually in the so-called "incomplete forms."

In Volume I of the present series there are three interesting papers on the diagnosis of cardiac disease, as well as a paper on "Skin Grafting in the Late Treatment of Severe Burns," which merit a perusal. Here one also finds a very careful resumé of the progress of medicine and surgery by Stevens, Esdall, and Bloodgood. C. P. H.

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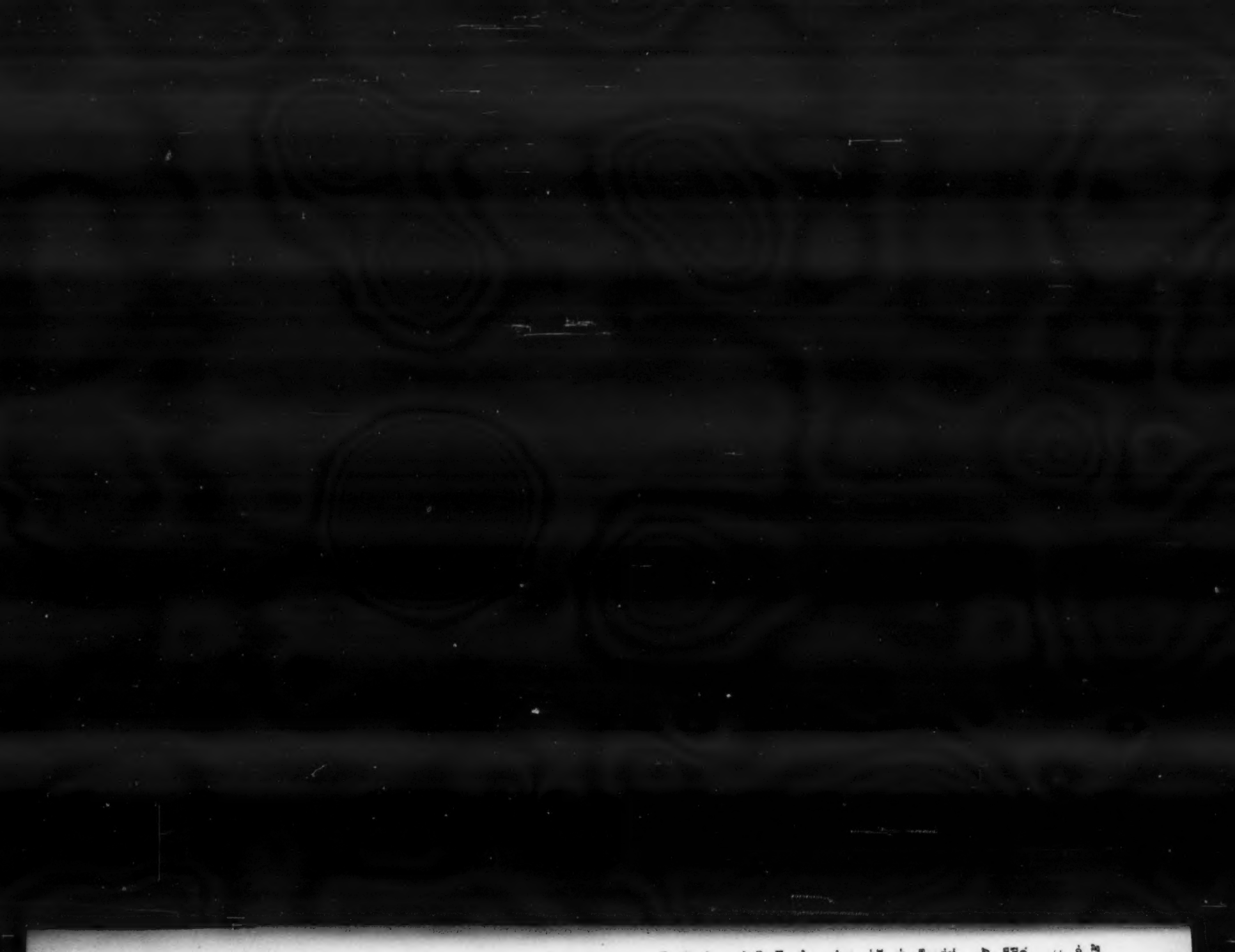
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